

# **EXHIBIT 63**

**Sullivan v. Saint-Gobain  
Performance Plastics Corp.:  
Expert Rebuttal Report on the Merits**

***Prepared for:***  
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### Summary of Qualifications

In addition to the qualifications summarized in my class certification report, I have recently been elected as the current Vice President and President Elect of the Geological Society of America, an international professional geological organization with 25,000 professional members.

I reserve the right to supplement this report and the professional opinions contained herein upon review of additional or supplemental information or data.

My fees are \$300/hr for my time in study and testimony in this case.

A handwritten signature in black ink, appearing to read "Donald Siegel". The signature is fluid and cursive, with the first name "Donald" and last name "Siegel" clearly distinguishable.

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Donald Siegel, Ph.D.  
Professor of Hydrogeology

## **1.0 Introduction**

My rebuttal opinions herein focus on Opinion 2 rendered in Defendant's expert report offered by Daniel J. Morrissey of McDonald Morrissey Associates, LLC. (Morrissey, 2018, p.4).

**2.0 Morrissey Opinion 2: The time required for PFOA to travel from land surface to groundwater is highly variable across the study area.**

I agree with Mr. Morrissey that timing of PFOA to initially to pass through soils and reach the water table inherently will be variable across the Zone of Contamination in Bennington and North Bennington. There is local heterogeneity in soils that enhanced or diminished how fast recharge contaminated with PFOA deposited on the ground by ChemFab/Saint-Gobain traveled to the water table. Some soils likely have vertical preferential flow paths that focus recharge and others may not. Some soils are siltier than others. I acknowledged this heterogeneity on page 2.2 of my Class Certification Report.

The Rao et al. (1985) approach I used does not address these uncertainties at the local, home-scale level, because there are no actual data on all of the soil properties and depths to the groundwater at most domestic wells. Although the method originally was designed to assess pesticide application to the land surface, the physics and chemistry for chemical compounds incorporated in the approach is the same for PFOA. Properties of the chemical of concern change according to the chemical considered. As Rao et al. (1985) wrote:

A number of comprehensive computer simulation models are available for site-specific evaluations of the pesticide behavior in the root zone . . . Models have also been developed to describe the various environmental processes that influence pesticide dynamics in soils . . . Such models are usually data intensive and require knowledge of a number of soil environmental, crop and pesticide parameters. In a majority of the cases, such parameters are neither available nor likely to be available in the near future do to the high cost associated with obtaining such data for a large number of soil-crop-pesticide combinations. (p. 1).

Hence, I used the Rao et al. (1985) approach not on a site specific basis, but to determine the degree to which the groundwater in the Bennington and North Bennington area is intrinsically susceptible to contamination by deposition of PFOA onto the surface and about how long it took for the PFOA contamination to reach the water table from the land surface. These calculations were performed using soil properties and other properties that are within the

ranges for these properties reasonably expected to be found in the Bennington area (Table 1, Merits Report).

The results show that the Bennington and North Bennington landscape is highly vulnerable to contamination from the land surface. Table 1 of my Merits Report shows the ranges of the properties I used. In addition to these ranges of properties, I used a value for recharge that others have assumed, which is reasonable for this area (indicated in Table 1 of Merits Report).

I arrived at travel times of just a few years where the water table is shallow, for example, five feet below the land surface, near streams, lakes and wetland areas. Where I assumed the water table was deeper, up to 30 feet below the land surface, the time for transport would be about five or six years. In my Merits Report, I used an even deeper value of 35 feet, so as not to bias the results to short times, and came to a similar value.

The actual depth of the water table at any given location in the Bennington area is not known in most places, but based on my 40-year experience studying the water table in similar glaciated environments, the depth range I used is reasonable. However, the water table in some local places could very well be shallower or deeper, decreasing or increasing the time for transport .

Mr. Morrissey independently performed the same exercise as I did, shown in his Figure 13 (Figure 1 here). He chose to vary recharge and percent organic matter in the soil. as well. In the first two columns. Morrissey reaches similar conclusions as I have, that PFOA deposited on the land surface would reach the water table within a few to about 10 years. We differ in his longest calculated time for travel, over 50 years. as shown in the third column of his Figure 13.

Based on this third column, he reports:

Experimentation with Dr. Siegel's approach demonstrates the significant uncertainty associated with his reported results. As presented in Figure 13, relatively minor modifications to parameter input values in the Rao et al. (1985) equations produce a range of travel times – a range that spans an order of magnitude (approximately 4.4 years to greater than 56 years); whereas, Dr.

Siegel reports a maximum travel time of about ten years and uses a six-year travel time in other calculations. Two of the variables that contribute to this broad range are the assumed fraction of organic carbon in the soil (ranging from 0.001 to 0.01 grams of organic carbon per gram of soil) and the annual rate of recharge (ranging from approximately 17.5 inches per year to approximately 21.5 inches per year) (p. 21-22)

I do not know what Mr. Morrissey means by the words “relatively minor modifications to parameter input values,” because for the third column of his calculations he used an organic carbon content of soil (0.010 g/g or 1%) that is 10 times that of the lowest value. and far higher than would be found in the entire soil column above the water table anywhere in Bennington and North Bennington. Given his results, I assume he used from 20-30 feet depths to water. In any case, the first two columns of his Figure 13 agree with my own calculations of travel time of PFOA through soils to groundwater in less than 10 years.

His use of 1 percent average organic matter throughout a 20-30 feet soil profiles is off base, and renders his third column calculation implausible. In the Bennington area (and elsewhere in temperate forested regions), relatively high percentages of organic matter only occur in the *upper six inches* of soils or less, the “turf” or “duff” of the soil. Below this depth, organic content decreases exponentially, because decayed plant material is sparse below the upper half foot of organic accumulation (C.T.Male, 2017 and Barr, 2018). Thick mineral soils have an *average* soil organic content far less, and by my calculations from data in Male (2016), on the order of ten times less than what Morrissey used in his calculations to arrive at an implausible travel time of over 50 years in this environment so highly susceptible to contamination.

The fact remains that in Bennington and North Bennington, PFOA in groundwater occurs both beneath soils tens of feet thick, and also where soils thinly mantle bedrock which is almost at the land surface. In these latter places, the transport of PFOA downward with rain would be relatively fast, once PFOA was deposited on the soil, much like rain seeping through fractured sidewalks. In the thick sand and gravel soils transport would take longer, but would still be fast compared to silty and clayey soils, because sand and gravel are highly permeable.

I stand by my opinion that PFOA initially got to the water table everywhere in the Bennington area within *about* 10 years of being deposited on the soils, except at rare soil outliers that might have particularly unusual hydrogeologic conditions, such as the thick, tight soils under the Bennington Landfill that prevent recharge to bedrock below.



## References

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Siegel, D., 2017b. Sullivan v. Saint-Gobain Performance Plastics Corp.: Expert Report on the Merits: Prepared for Langrock, Sperry & Wool, LLP.

## Figures

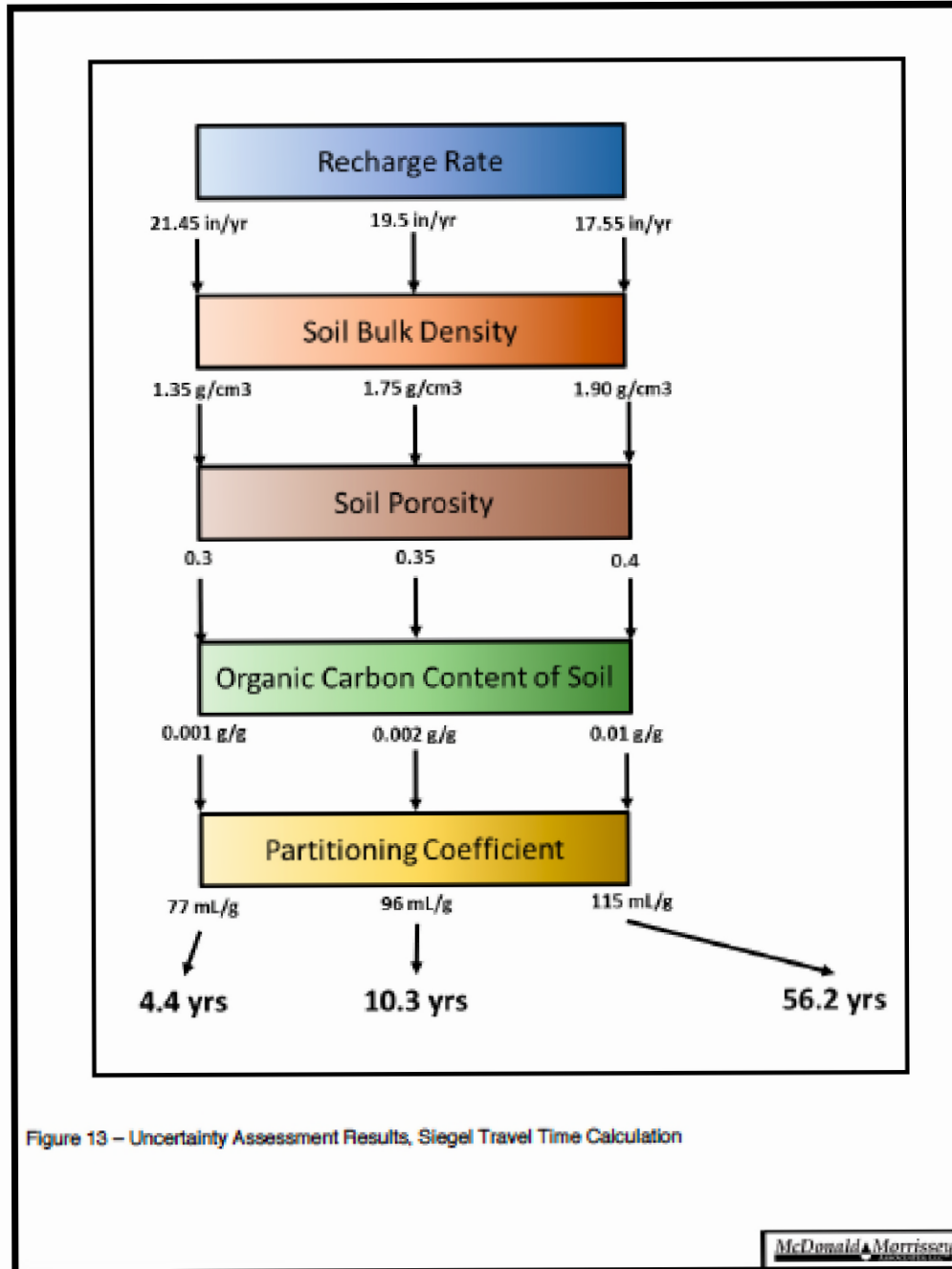


Figure 1  
Figure 13 from Morrissey (2018)